Annual Performance Report
2009

Wellington Wastewater Treatment Plant

The Corporation of
The County of Prince Edward

Water and Wastewater Services
322 Main Street, Picton ON
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Annual Wastewater Performance Report

Corporation of the County of Prince Edward
Wellington Wastewater Treatment Facility

MOE Identifier No. 120003165
Certificate of Approval No. 0157-6T6JBG

Summary of all monitoring data and analytical data collected relative to the works during the reporting period

Table 1: Effluent Quality: Compliance Parameters, 2009

	CBOD		E. coli	Total Suspended Solids		Total Phosphorus		pH	
CofA LIMITS	25 mg/L Monthly Average Concentration	37.5 kg/d Annual Average Loading	200 cts/100 mL Monthly Geometric Mean	25 mg/L Monthly Average Concentration	37.5 kg/d Annual Average Loading	1.0 mg/L Monthly Mean Concentration	.75 kg/d Cumulative Annual Average Loading	5.5	9.5
Month	Concentration mg/L	Waste Loading kg/d	counts/100 mL	Concentration mg/L	Waste Loading kg/d	Concentration mg/L	Waste Loading kg/d	min	max
January	2.0	14.4	20	5.0	4.9	0.14	0.11	7.1	7.5
February	4.3	8.0	27	25.9	3.7	0.54	0.33	6.5	7.3
March	2.0	7.3	20	6.3	7.2	0.15	0.27	6.7	6.9
April	3.5	6.6	40	10.8	6.8	0.20	0.26	6.3	6.9
May	2.0	5.6	20	7.1	6.3	0.20	0.24	6.8	6.9
June	2.0	5.6	20	2.8	6.3	0.20	0.22	6.6	7.0
July	2.0	5.3	20	3.5	6.1	0.13	0.20	6.5	7.3
August	2.0	5.0	13	2.0	6.1	0.24	0.19	6.4	7.4
September	6.6	4.6	20	4.7	5.9	0.79	0.22	6.6	6.8
October	5.3	6.2	20	1.7	8.0	0.09	0.20	6.6	7.1
November	2.0	5.8	20	1.7	8.2	0.07	0.19	7.0	7.6
December	2.0	5.8	20	3.5	11.5	0.05	0.18	6.5	7.2
Annual Averages	**3.0**		**21.6**	**6.3**		**0.2**		**6.6**	**7.2**

* Please note: pH values were obtained from plant process data sheets, not laboratory values to allow a representative value for daily values gathered.

Table 1 illustrates all parameter values monitored for compliance purposes and tabulated for analysis over the 2009 operational year. Please note that monthly averages are utilized for determining compliance with the applicable Certificate of Approval.

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Table 2: Effluent Quality Monitoring Data, 2009

	Total Ammonia Nitrogen	Un-Ionized Ammonia	Temperature	Total Residual Chlorine
Month	mg/L	mg/L	°C	mg/L
January	5.37	0.018	6.3	1.20
February	6.97	0.063	6.8	0.8
March	0.56	0.010	8.2	0.54
April	3.81	0.010	8.8	0.91
May	6.33	0.015	12.6	0.79
June	4.52	0.014	16.4	0.71
July	11.16	0.025	18.9	0.68
August	8.36	0.072	21.0	0.74
September	12.23	0.022	19.5	1.18
October	2.81	0.010	15.4	0.86
November	0.41	0.010	13.4	0.72
December	0.66	0.013	10.3	0.74
Annual Averages	**5.26**	**0.02**		

* Please note: Total Residual Chlorine values were obtained from plant process data sheets, not laboratory values to allow a representative value for daily values gathered.

Table 2 indicates additional sampling carried out for compliance (Total Chlorine Residual) and as quality assurance and operational controls on final effluent leaving the Wellington Wastewater Treatment Facility.

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Table 3: Influent Quality Monitoring Data, 2009

	BOD	Total Kjeldahl Nitrogen	Total Phosphorus	Total Suspended Solids
Month	mg/L	mg/L	mg/L	mg/L
January	163.5	20	3.90	201
February	135	52	4.98	194
March	101.4	32.5	3.62	151
April	87.6	13	4.53	203
May	140.75	24	3.43	108
June	102	20	4.66	152
July	150.2	31	4.35	119
August	166.25	40	5.80	165
September	132.6	30	4.88	71
October	142.5	30	5.15	95
November	162.75	40	5.65	210
December	112.8	51	3.72	148
Annual Averages	**133**	**32**	**5**	**151**

Table 3 indicates the influent monitoring parameters for the purposes of operational controls and determination of percent removal from final effluent.

Effluent Quantity: Capacity Assessment

The average monthly flow rate remained consistent throughout 2009, with slightly increased flows in April, and December. The average daily flow for 2008 was consistently below the approved capacity.

The annual average flow for 2009 was 830 m³/d (55.4 % of the approved capacity).

Based on the 2009 flow data, the Wellington Wastewater Treatment Facility was able to maintain capacity approval requirements as per Certificate of Approval No.0157-6T6JBG during normal weather conditions. Peak flows were exceeded during bypass events which can be reviewed in on page 16.

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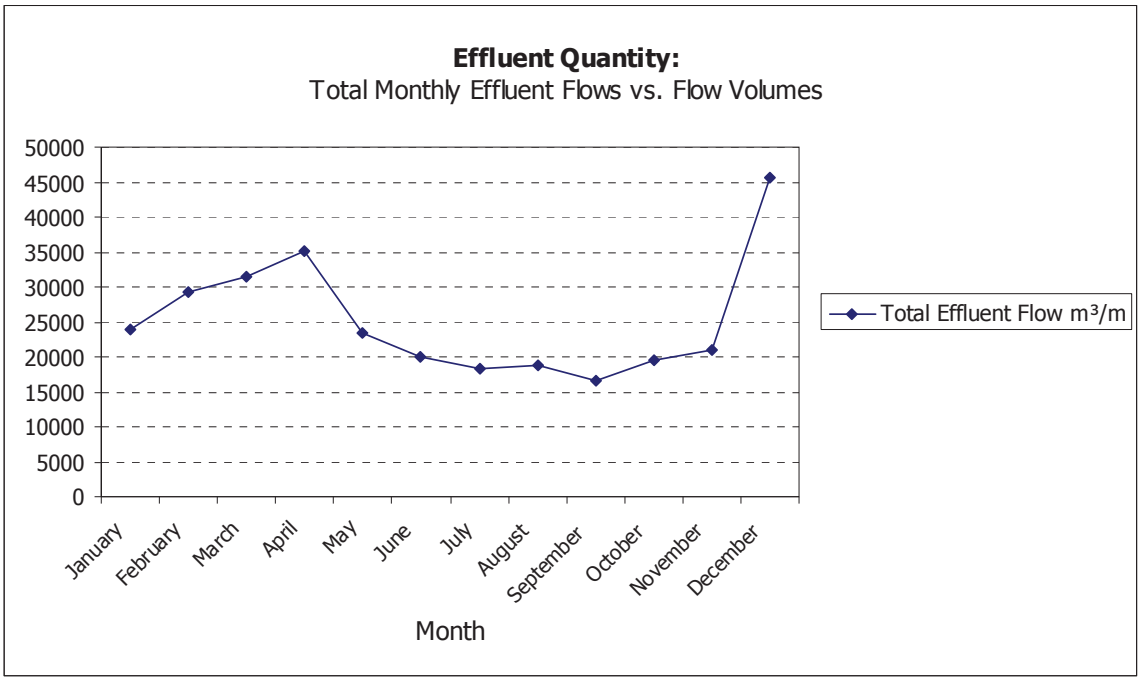
Table 4: Effluent Quantity; Flow Data 2009

	Approved Capacity Annual Average	Annual Cumulative Average	Monthly Average	Peak Flow	Total Flow
Month	m³/day	m³/day	m³/day	m³/day	m³/month
January	*1,500*	770	770	1493.9	23876.8
February	*1,500*	909	1048	3156.2	29343.6
March	*1,500*	946	1018	2346	31573
April	*1,500*	1001	1167	3056.5	35010.8
May	*1,500*	951	752	1198.1	23311.4
June	*1,500*	904	667	901.4	20020.9
July	*1,500*	859	591	903.2	18324
August	*1,500*	827	603	859.2	18686.8
September	*1,500*	797	554	839.5	16624
October	*1,500*	780	626	947.6	19404.2
November	*1,500*	772	699	1125.6	20972.3
December	*1,500*	830	1469	1054.8	45534.24



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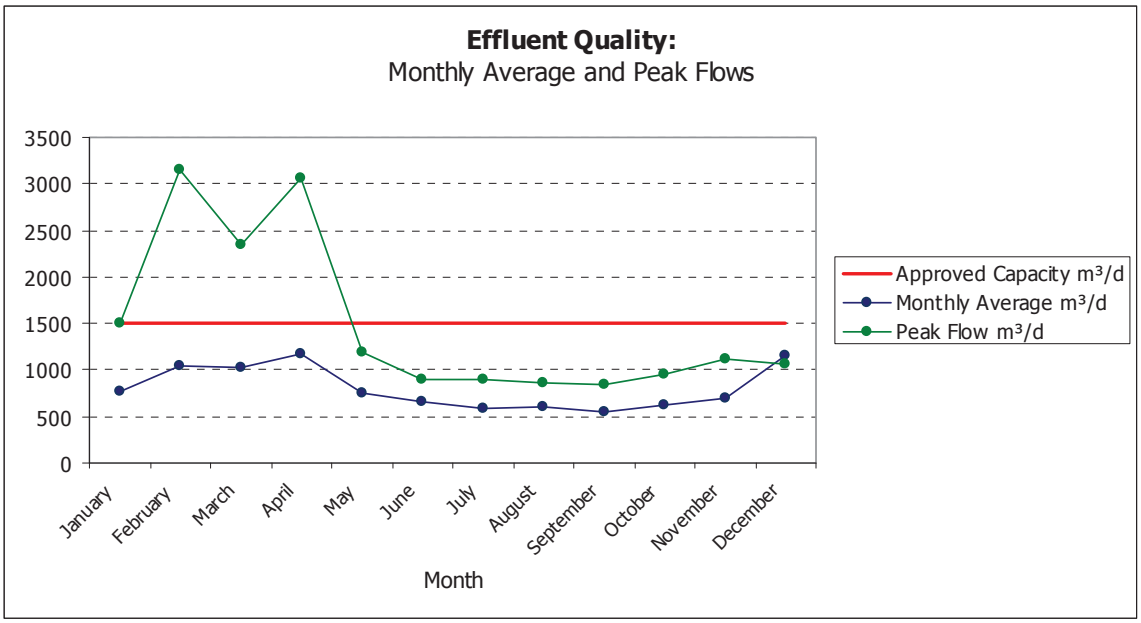
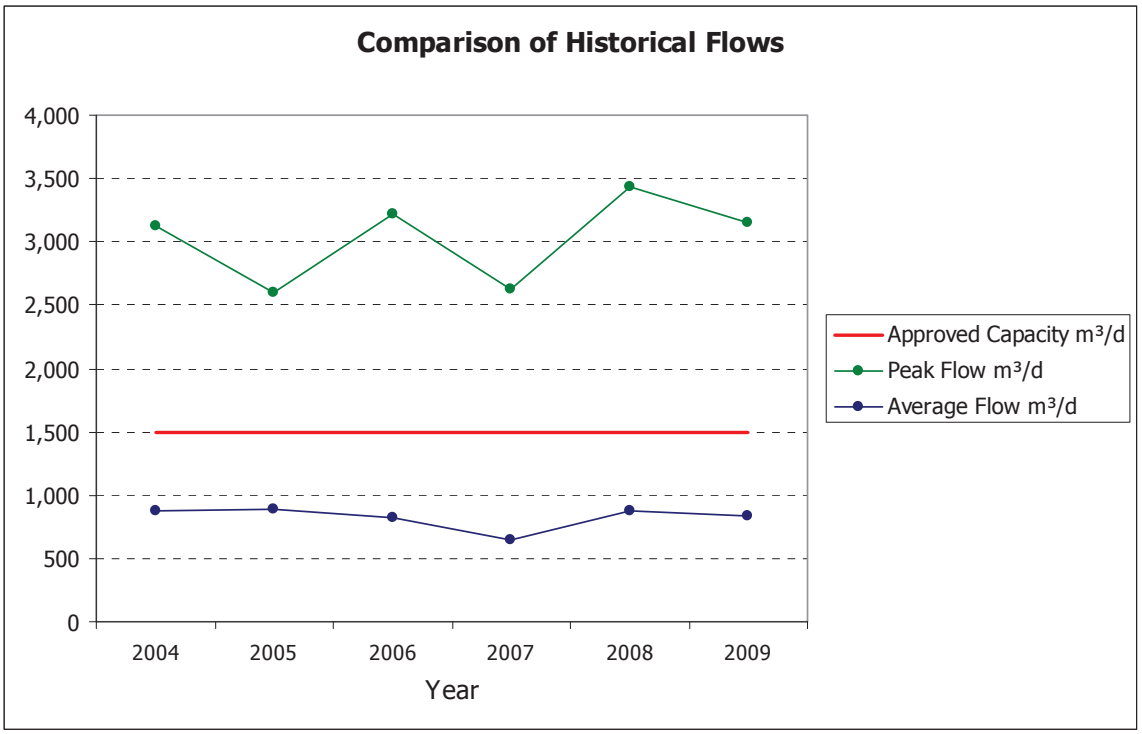


Table 5: Historical Effluent Flows, 2003-2009

	Approved Capacity	Annual Average Flow	Peak Flow
Year	m³/day	m³/day	m³/day
2004	1,500	878	3,123
2005	1,500	891	2,606
2006	1,500	827	3,217
2007	1,500	649	2,624
2008	1,500	876	3,436
2009	1,500	830	3,156



Effluent Quality – Carbonaceous Biological Oxygen Demand (CBOD)

Both influent and effluent at the Wellington Wastewater Treatment Plant are monitored for Biological Oxygen Demand (BOD) and Carbonaceous Biological Oxygen Demand (CBOD), respectively on a weekly basis. The effluent monitoring meets the Certificate of Approval requirements, while sampling influent for BOD values exceeds the requirements of the applicable Certificate of Approval and is used as an operational control.

Although the CBOD concentrations in the effluent are being compared to the BOD concentrations in the influent, the average reduction rate of 97.7 % is a good indicator of the efficiency of the treatment process. As well, the CBOD concentrations are such that the Wellington Wastewater Treatment Facility was consistently below the Effluent Objectives of the Certificate of Approval.

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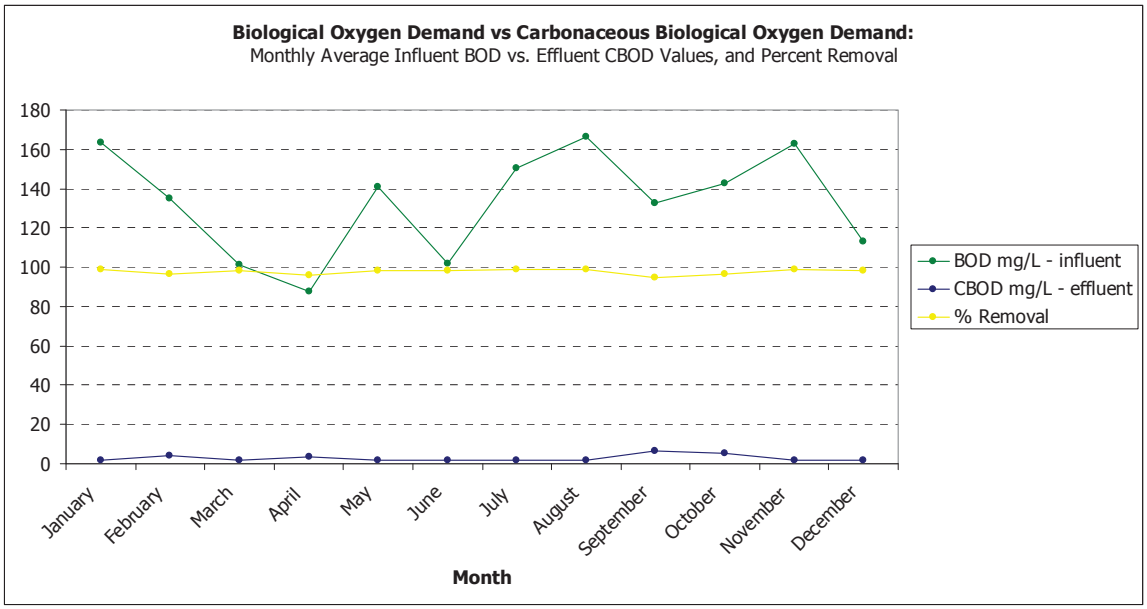

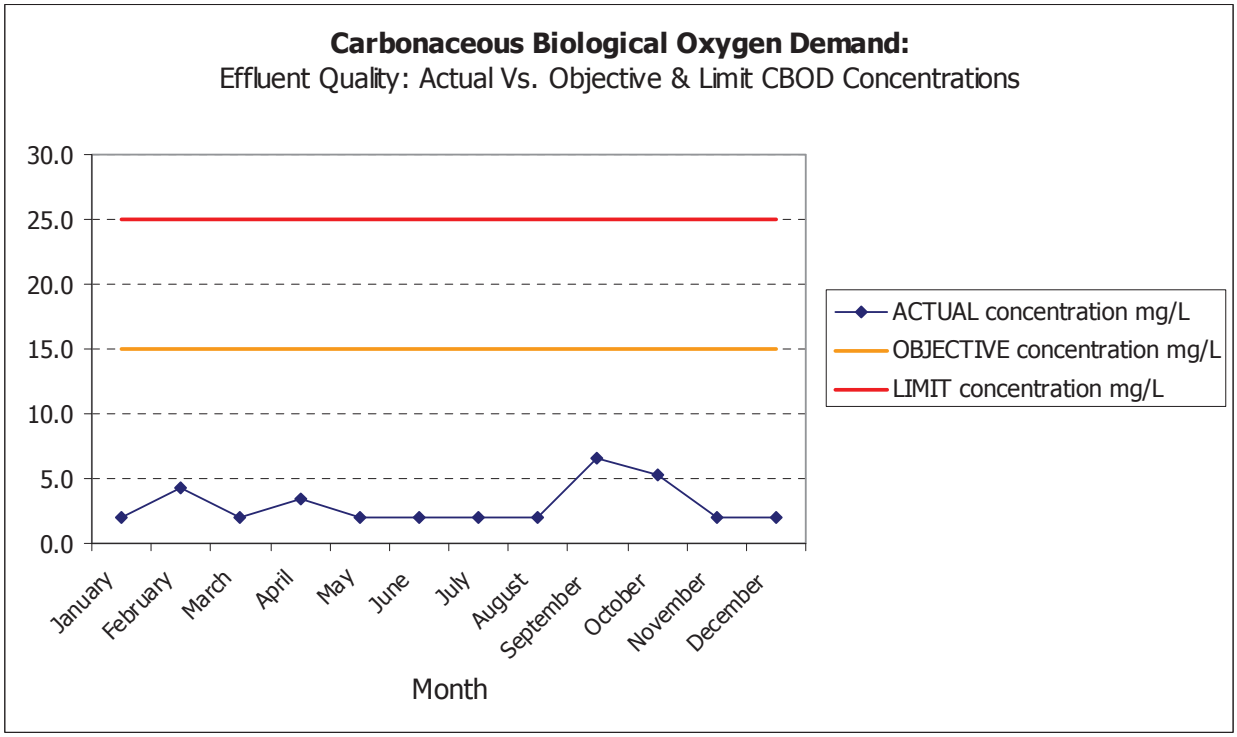

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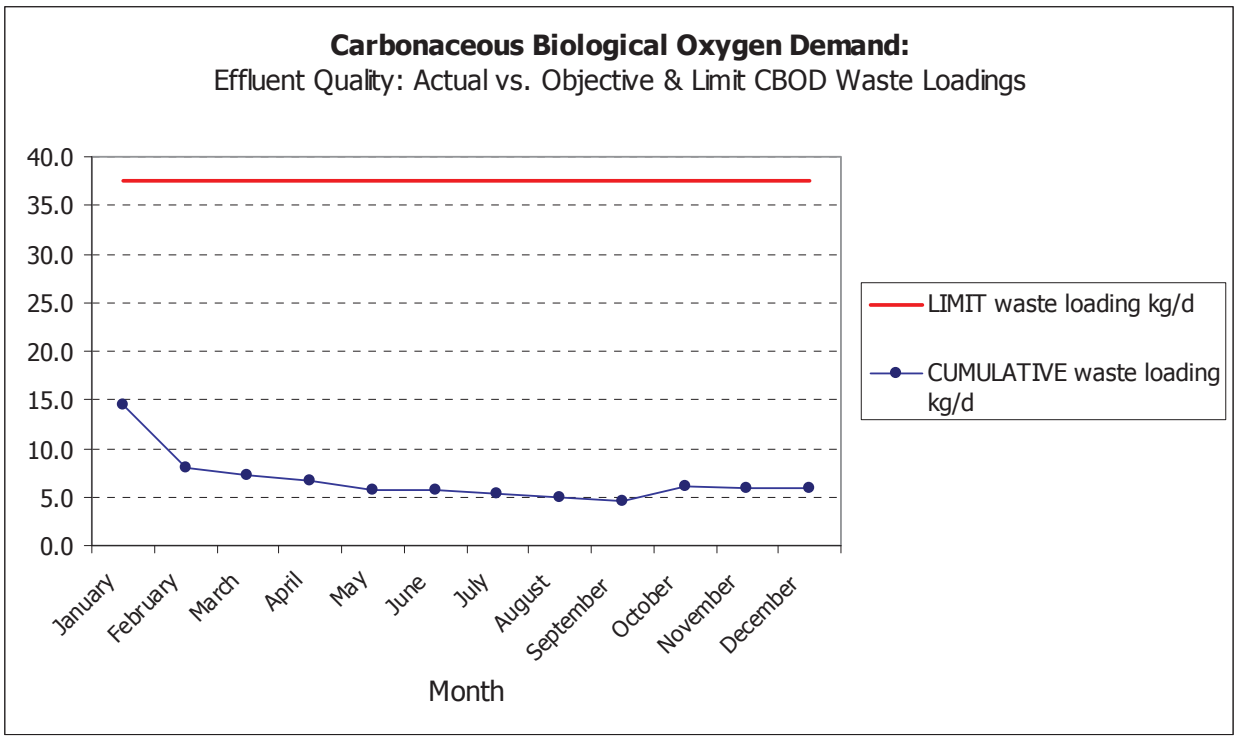

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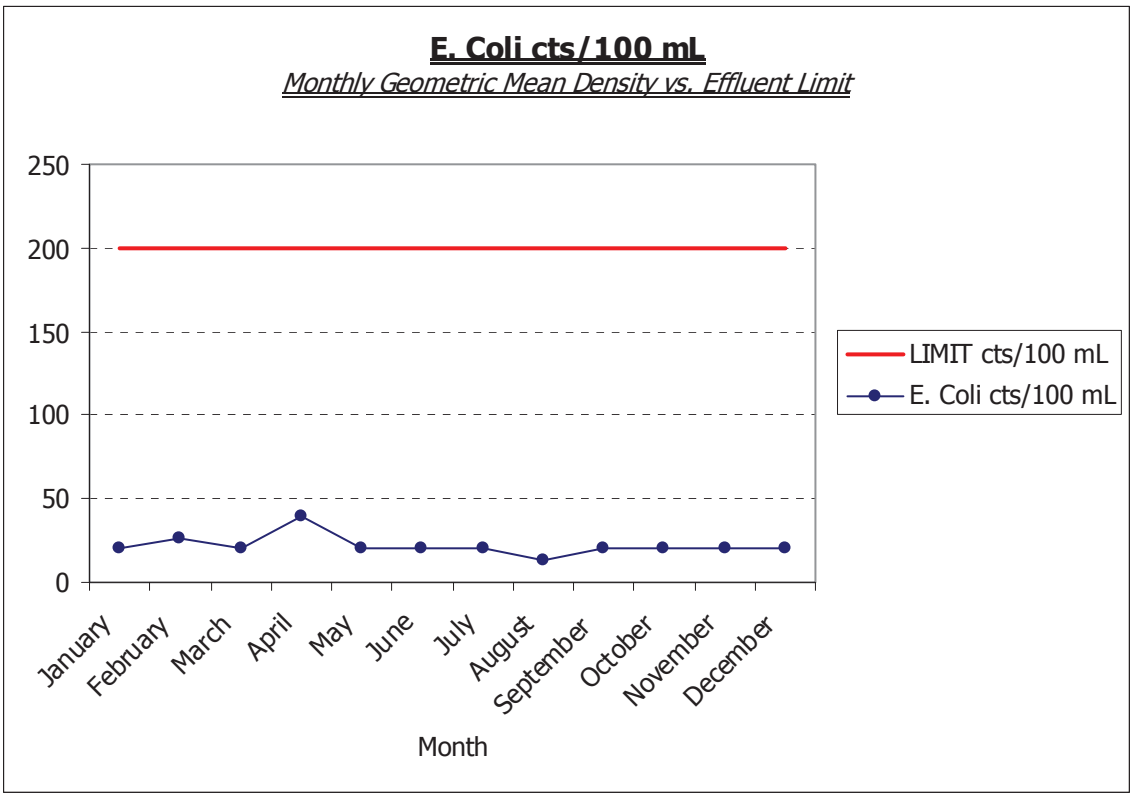
Effluent Quality - Disinfection

The effluent was monitored weekly for E. coli levels to determine the efficiency of the disinfection process. This monitoring meets Certificate of Approval requirements. The performance of the disinfection process was successful for 2009 as the monthly geometric mean of E. Coli organisms did not exceed the limit as stated in the Certificate of Approval.



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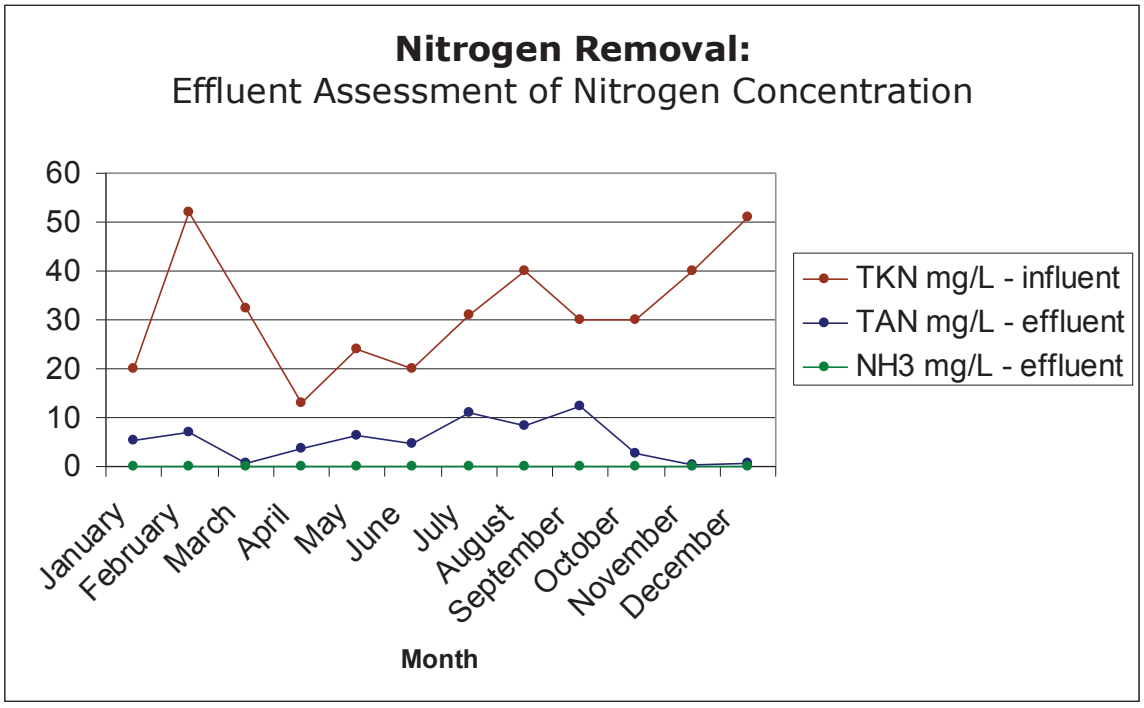
Effluent Quality - Nitrogen Removal

Effluent from Wellington Water Treatment Plant is monitored weekly for Total Ammonia Nitrogen (TAN), Total Kjeldahl Nitrogen was monitored monthly in the raw wastewater entering the plant. This monitoring meets the requirements of the applicable Certificate of Approval. Additionally, un-ionized ammonia (NH3) is monitored in effluent water.



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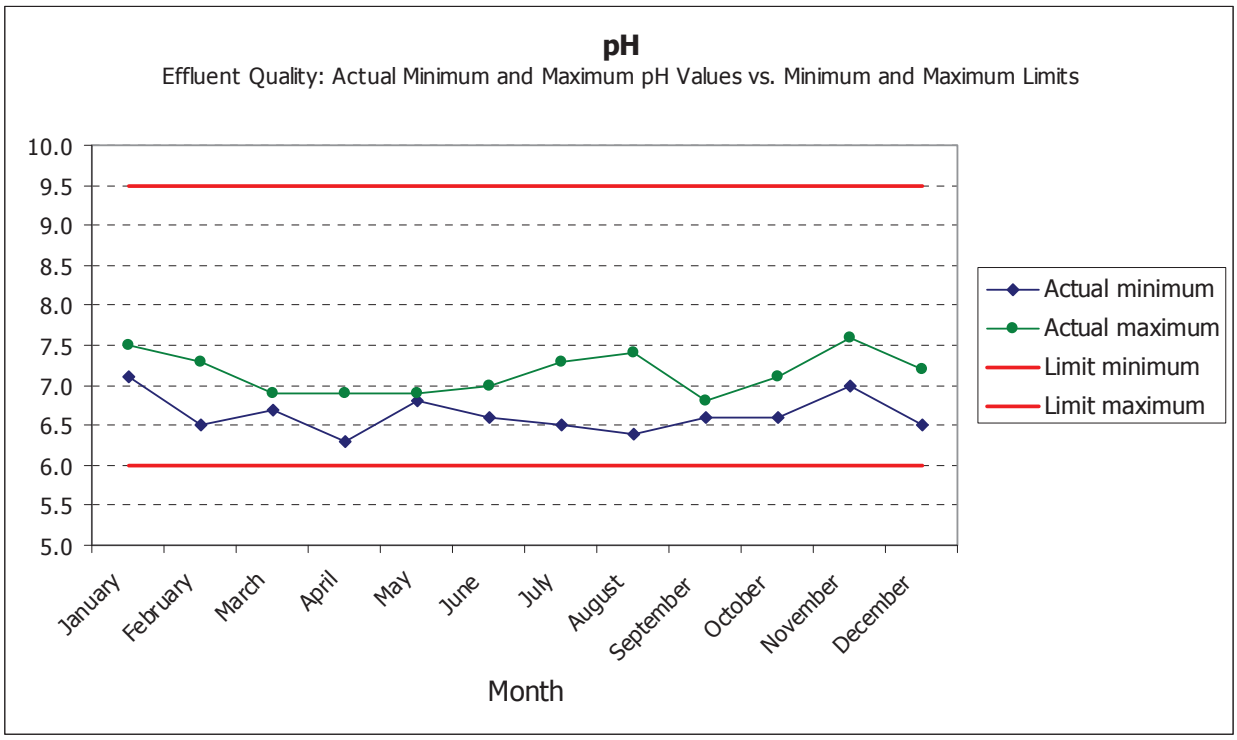
Effluent Quality – pH

The pH of the effluent was monitored on a daily basis and maintained between the limits as stated in the Certificate of Approval. Data was obtained from plant process data sheets to generate the graph as indicated below.



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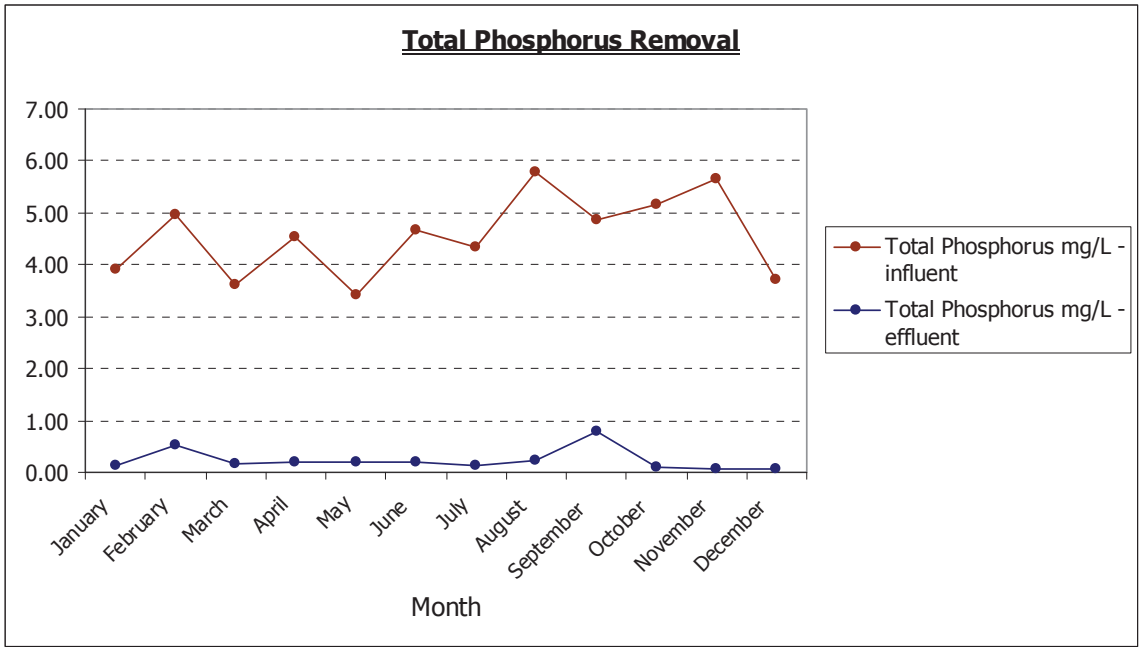
Effluent Quality – Total Phosphorus

The effluent was monitored for Total Phosphorus on a weekly basis meeting the requirements of the Certificate of Approval. Additional monitoring was performed on the influent; weekly to enable process control and analysis of the treatment process.

Under normal operating conditions, the Total Phosphorus concentrations and waste loadings were consistently below the stated Effluent Limits in the Certificate of Approval. The average Total Phosphorus removal for 2009 operational year was 94.9% which includes all bypass events throughout the year.



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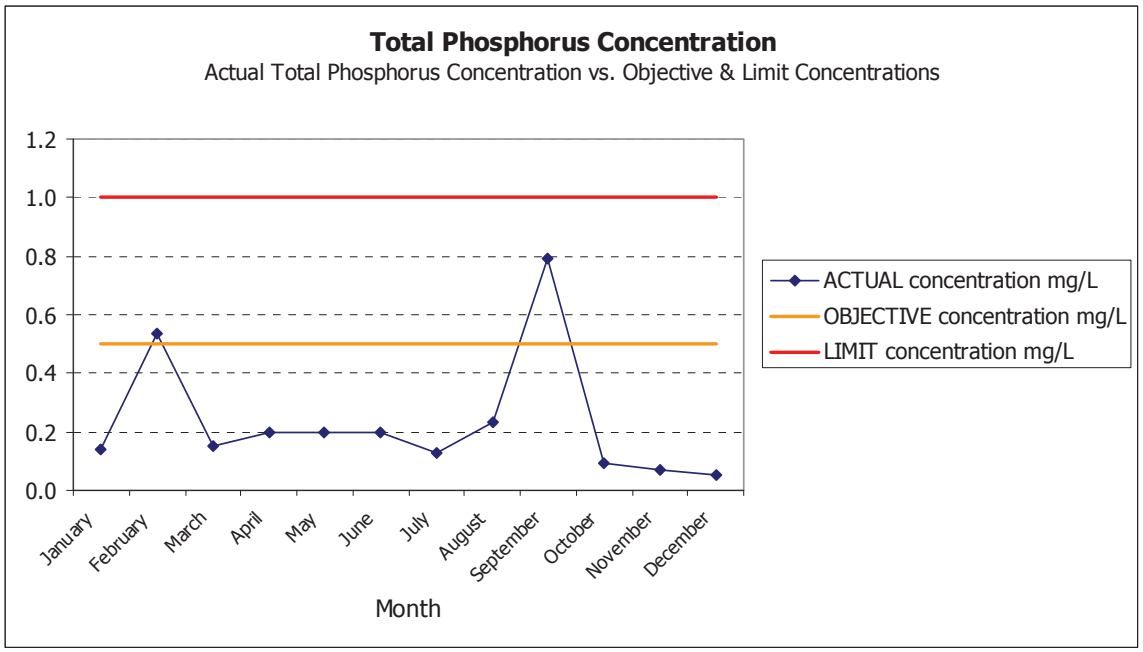

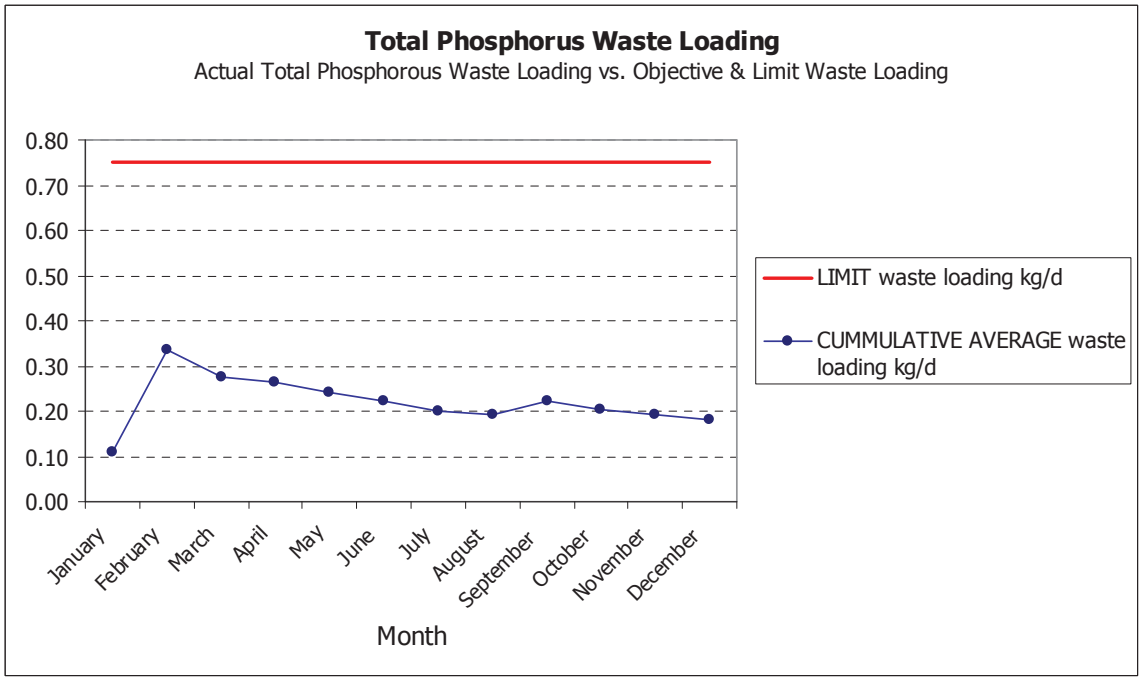

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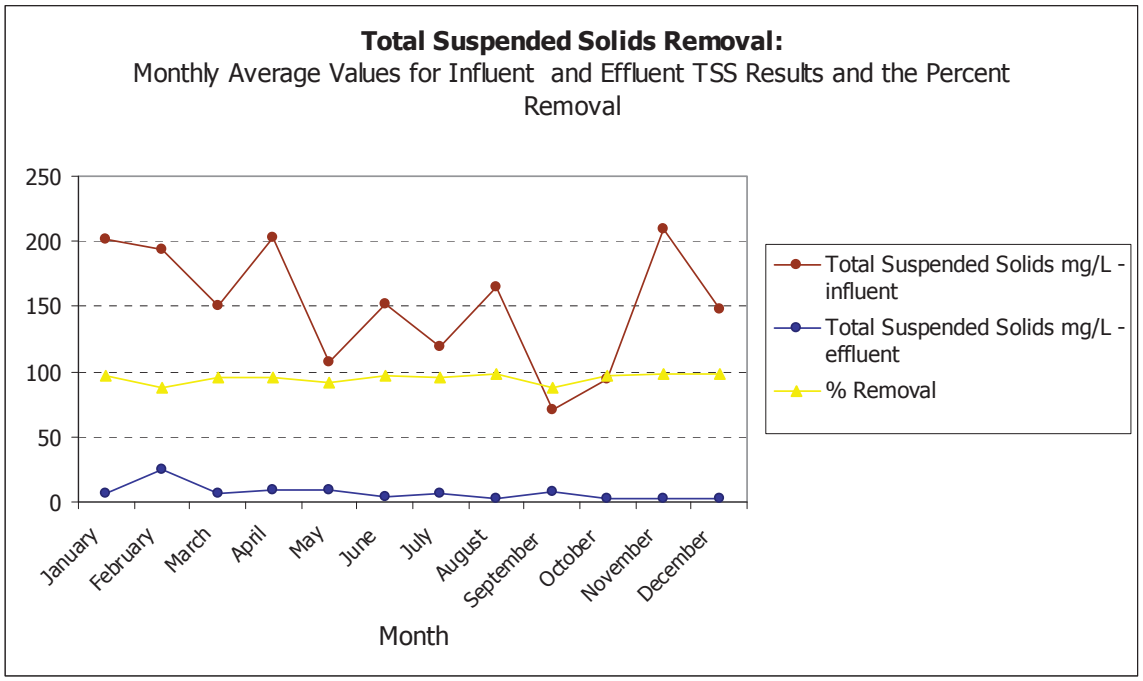
Effluent Quality – Total Suspended Solids

The influent and effluent waters of the Wellington WWTP were monitored for Total Suspended Solids on a weekly basis for 2009 – an increased frequency above what the Certificate of Approval requires.

The Total Suspended Solids concentrations and waste loadings were consistently below the stated Effluent Objectives in the Certificate of Approval, except during abnormal conditions which can be specifically seen in February on account of a plant bypass event. The average Total Suspended Solids removal was 94.9% for 2009.



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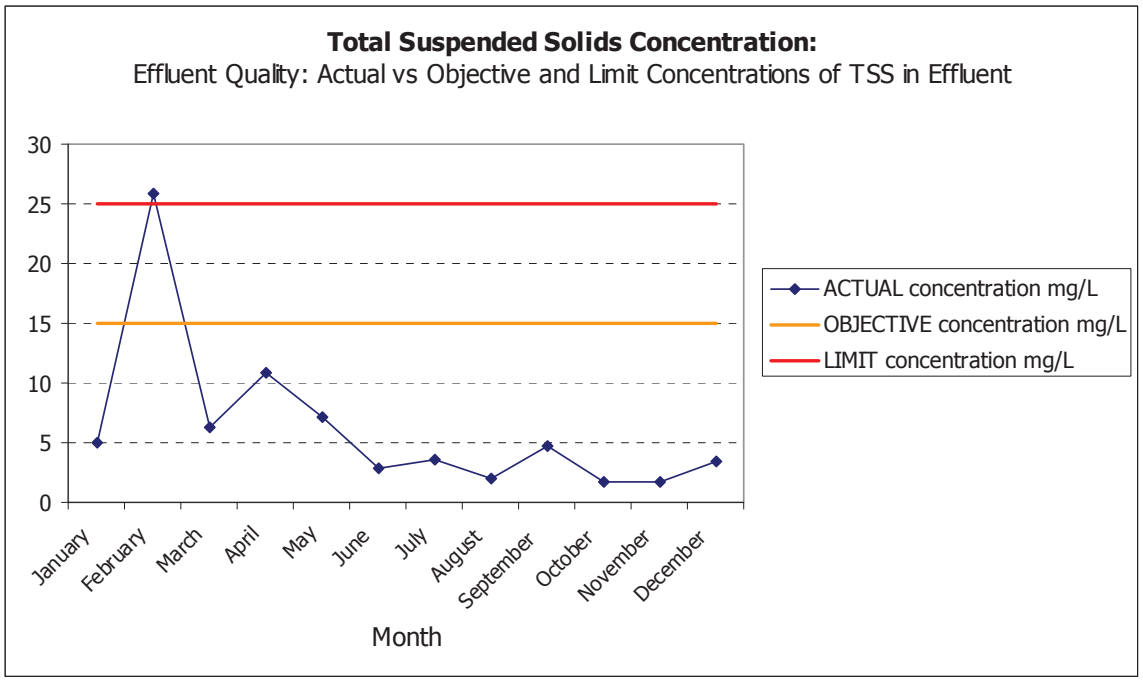

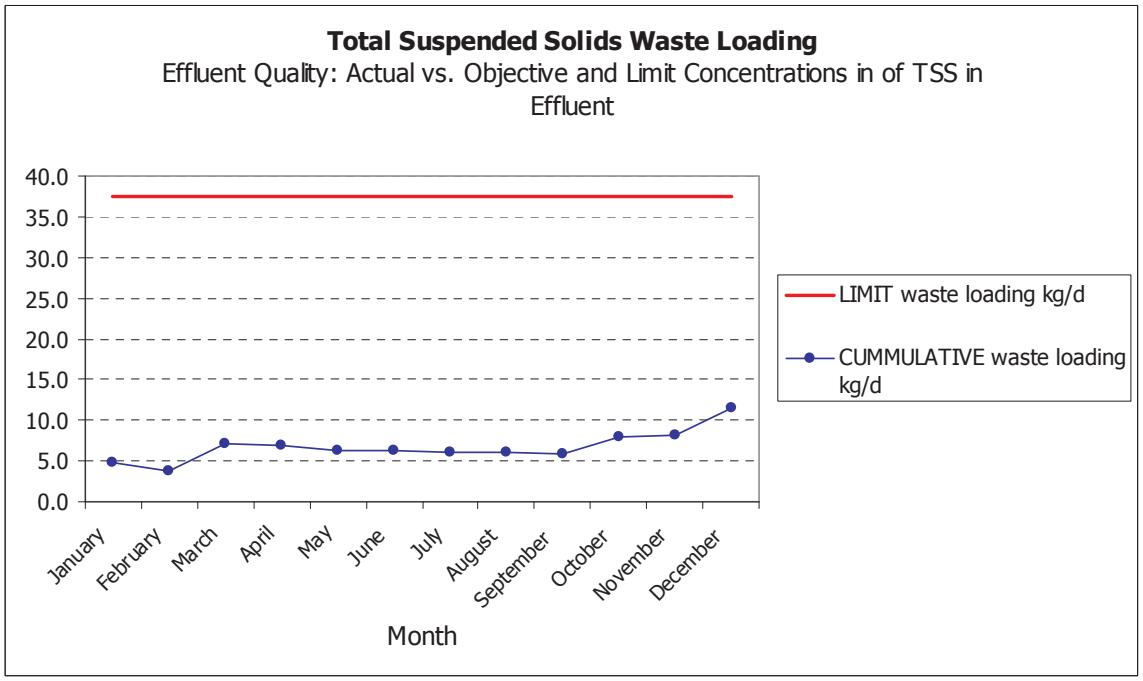

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Bypass and Upset condition Summary for all events that have occurred in the 2009 Operational year

Table 6: 2009 Bypass and Upset Condition Summary

Date	Description
February 12, 2009	The sludge blanket in the clarifier reached the surface of the clarifier and spilled over the weir causing noticeable turbidity in the contact chamber. A waste process was initiated to lower the sludge blanket. The approximate amount of activated sludge flowing over the weir into the contact chamber was estimated to be 54 m3. Effluent samples were taken during and following the upset.
February 2009	Wellington Wastewater Treatment Plant experienced an exceedance of the monthly average concentration of total suspended solids for the month of February 2009 at a concentration of 27 mg/L vs. the limit concentration of 25mg/L in final effluent.
March 2009	Total Kjeldhal Nitrogen sample was not performed on an influent sample as per the requirement under Section 9 of the applicable Certificate of Approval, Sampling calendar and Chain of Custody has been reviewed.

Overview of the success and adequacy of the Works - Effluent Quality vs. Quantity

The Wellington WWTP was successful in producing a good quality effluent during normal weather conditions, with the rated capacity of the facility being more than adequate to handle the normal peak and daily flows while maintaining consistent and appropriate treatment requirements. Overall, increases in percent removal for various parameters have been exhibited between the 2008 and 2009 operational years indicating an improvement of process control at the plant.

Description of any operating problems encountered and corrective actions taken during 2009

Please review the summary of reporting for 2009 as laid out on page sixteen (16) with regard to the Wellington Wastewater Treatment Facility.

Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works

- Routine preventative maintenance performed throughout the 2009 operational year

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- During 2010, SCADA upgrades and integration of the chlorine analyzer will be carried out at the Wellington Wastewater Treatment Facility

Summary of any effluent quality assurance or control measures undertaken in 2008

Effluent analyses on all parameters are performed by accredited laboratory; Caduceon Environmental Laboratories. BOD, CBOD, Total Suspended Solids (TSS), Total, Total Phosphorus (TP), TKN, Ammonium and and microbiological analysis are conducted by the laboratory for compliance purposes and operational controls. In addition to laboratory sampling, in house analysis for pH, Temperature, Total Chlorine Residual, Total Phosphorus, TSS and VSS are carried out by certified operators for the County of Prince Edward Water and Wastewater Services Department. Of the in house analysis conducted, Total Chlorine Residual and pH are conducted for compliance conformance, while the other parameters are utilized for operational controls.

It should be noted that samples are conducted in excess of the Certificate of Approval requirements as laid out by the Ministry of the Environment. Moving forward, the County of Prince Edward Water and Wastewater Services will continue to evaluate the adjust the frequency and variety of non-regulative samples conducted at the Wellington Wastewater Treatment Facility to ensure that the control measures for assuring effluent quality are optimized for plant operational efficiency and success.